CLAIMS

1. A device for flowing a liquid on a surface, the device comprising:

a flow path;

a first port for supplying the liquid to one end of the flow path and for applying a first port pressure for retaining the liquid when the flow path is remote from the surface;

a second port for receiving the liquid from the other end of the flow path and for applying a second port pressure such that the difference between the first and second negative port pressures is oriented to promote flow of the liquid from the first port to the second port via the flow path in response to the flow path being located proximal to the surface and the liquid in the device contacting the surface; and,

the first and second port pressures being such that the liquid is drawn towards at least the second port in response to withdrawal of the flow path from the surface.

2. A device as claimed in claim 1, comprising a protrusion extending into the flow path adjacent the first port for directing the liquid from the first port towards the surface.

3. A device as claimed in claim 2, wherein the protrusion is resilient.

4. A device as claimed in claim 1 comprising a peripheral flange surrounding the flow path for sealing the flow path to the surface when the device is proximal to the surface.

5. A device as claimed in claim 1 comprising:

a first opening communicating between the first port and the flow path for applying a first opening pressure to

the liquid in the first port, the first opening pressure being more negative than the first port pressure; and,

a second opening communicating between the flow path and the second port for applying a second opening pressure to the liquid in the flow path, the second opening pressure being more negative than the first port pressure.

6. A device as claimed in claim 5, comprising sides less wettable by the liquid and sides more wettable by the liquid, wherein the flow path is located on a more wettable side surrounded by less wettable sides.

7. A device as claimed in claim 5, comprising a body housing the first port and the second port and an extension protruding from the body to form the flow path, the first and second openings being disposed at opposite ends of the extension.

8. A device as claimed in claim 7, wherein sides of the extension surrounding the flow path are less wettable to the liquid than the flow path.

9. A device as claimed in claim 1, wherein the first port comprises a first capillary network for applying the first port pressure.

10. A device as claimed in claim 9, wherein the first capillary network comprises at least one of a plurality of parallel capillary members, a mesh, a porous material, and a fibrous material.

11. A device as claimed in claim 1, wherein the second port comprises a second capillary network for applying the second port pressure.

12. A device as claimed in claim 11, wherein the second capillary network comprises at least one of a plurality of parallel capillary members, a mesh, a porous material, and a fibrous material.

13. A device as claimed in claim 1 comprising a plurality of first ports each coupled to the flow path.

14. A device as claimed in claim 1 comprising a plurality of second ports each coupled to the flow path.

15. A device as claimed in claim 1 wherein the flow path has a curved cross section.

16. A device as claimed in claim 1 wherein the flow path has a rectangular cross section.

17. A device as claimed in claim 1, formed from a material selected from the group consisting of elastomer, silicon, SU-8, photoresist, thermoplastic, ceramic, and metal.

18. A device as claimed in claim 1 of layered construction.

19. A device as claimed in claim 18, wherein each layer is formed from a material selected from the group consisting of elastomer, silicon, SU-8, photoresist, thermoplastic, metal, and ceramics.

20. A device as claimed in claim 2, wherein the flow path is approximately 100 micrometers in length and approximately 100 micrometers in width, the volumes of first and second ports are 500 nanoliters each, and, in use, the protrusion defines a spacing between the device and the surface in region of between 1 and 10 micrometers.

21. A device as claimed in claim 1, wherein the first and second port pressures are such that the liquid is drawn towards the first port and the second port in response to withdrawal of the flow path from the surface.

22. A method for flowing a liquid on a surface, the method comprising:

supplying the liquid from a first port of an applicator device to one end of a flow path of the device;

applying to the liquid a first port pressure via the first port;

receiving the liquid from the other end of the flow path in a second port of the device;

applying to the liquid via the second port a second port pressure different to the first port pressure;

promoting, via the difference between the first and second port pressures, flow of the liquid from the first port to the second port via the flow path in response to the flow path being located proximal to the surface and the liquid therein contacting the surface; and,

drawing, via the first and second port pressures, the liquid towards at least the second port in response to withdrawal of the flow path from the surface.

23. A method as claimed in claim 22, further comprising, following withdrawal of the flow path from the surface, relocating the device at another position on the surface.

24. A method as claimed in claim 22, further comprising, following withdrawal of the flow path from the surface, relocating the device on another surface.

25. A method as claimed in claim 22, further comprising contacting the surface with the device and thereafter spacing the device from the surface to define a surface

channel between the surface and the flow path for passage of the liquid from the first port to the second port.

26. A method as claimed in claim 22, comprising locating the device in a humid environment to initialize the flow of the liquid from the first port to the second port.

27. A method as claimed in claim 26, comprising cooling one or both of the device and the surface to initialize the flow of the liquid via condensation.

28. A method as claimed in claim 22, comprising applying an electric field between the device and the surface to initialize the flow of the liquid from the first port to the second port.

29. A method as claimed in claim 22, comprising applying a pressure pulse to the liquid to initialize the flow of the liquid from the first port to the second port.

30. A method as claimed in claim 22, comprising applying a heat pulse to the liquid to initialize the flow of the liquid from the first port to the second port via vaporization of the liquid.

31. A method as claimed in claim 22, comprising reversing the direction of flow of the liquid by reversing the pressure difference between the first port and the second port.

32. A method as claimed in claim 22, comprising drawing, via the first and second port pressures, the liquid towards the first and second ports in response to withdrawal of the flow path from the surface.